U. Minnesota

SEMI-ANNUAL STATUS REPORT
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"Plant Morphogenesis under Weightlessness"

The basic experimental operations outlined in our previous report have been continued. The resignation on 15 May of Mrs. T. Lerner, who has moved to New York, has necessitated the employment and training of a new technician, Miss Barbara Hampton, who was appointed on 1 June.

Dr. L. Loercher has taken time lapse motion pictures of Arabidopsis plants in sterile culture to record the growth and possible rhythmic movements of vegetative (day 7) to flowering phases (day 21). One film has been subjected to selected frame analysis which gives indication of movements of the flowering stem. This type of recording, at increased magnification, is being continued.

Under the circumstances of fluorescent-incandescent lighting held at 150 ± 10 foot candles and a temperature of ca. 24°C., in our growth chambers, a significant difference has been noted in form and development of the root-system of Arabidopsis plants grown on our clinostat (at 1/2 r. p. m.) in comparison with the vertical controls. To a considerable degree the clinostat cultures show a largely superficial root-system with a swirled or pinwheel arrangement with the branch (or secondary) roots penetrating the agar medium relatively late in development in contrast to the vertical controls where the root system typically involves early and deep penetration of the cultural medium without the extensive development of a swirled configuration at the surface of the agar.

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Measurements of length of internodes of the various cultures have been made. As can be noted in the following table, the cultures grown on the clinostat were 22% shorter than the controls. Length of successive internodes is greater, beginning with the fourth internode, in the vertical controls than in the clinostat specimens.

Table: Average Internode Length of Arabidopsis plants grown in sterile culture on the clinostat or in the vertical (control) position.

	Clinostat culture	Vertical (control) culture
A. Overall height (mm.)	56.3	72.2
B. Length (mm.) of internode No.:		
7	15.3	20.0
6	21.2	29.3
5	11.2	12.5
4	0.5	2.0
3	0.1	0.1
2	0.1	0.1
1	0.1	0.1
C. Length of hypocotyl	7.8	8.1

Fixations, strictly in situ, for cytological analysis have been made of vertical control and clinostat cultures.